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WATER SUPPLY OUTLOOK FOR WESTERN UNITED STATES

Including Columbia River Drainage in Canada



U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with
CALIFORNIA DEPARTMENT of WATER RESOURCES
and
BRITISH COLUMBIA DEPARTMENT of
LANDS, FORESTS and WATER RESOURCES

AS OF
MAY 1, 1974

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

*Cover Photo: Snow Surveyors near Ship Creek,
Alaska snow course.*

SCS PHOTO A-772-11

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 511 N. W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	204 E. 5th. Ave., Room 217, Anchorage, Alaska 99501
Arizona	6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82601

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



WATER SUPPLY OUTLOOK FOR WESTERN UNITED STATES

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ISSUED

MAY 1, 1974

The Soil Conservation Service coordinates snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Corps of Engineers, Forest Service, National Park Service, NOAA, National Weather Service, Geological Survey, and other Federal Agencies, Departments of State Government, Irrigation Districts, Power Companies, and others.

The Department of Water Resources coordinates snow surveys in California.

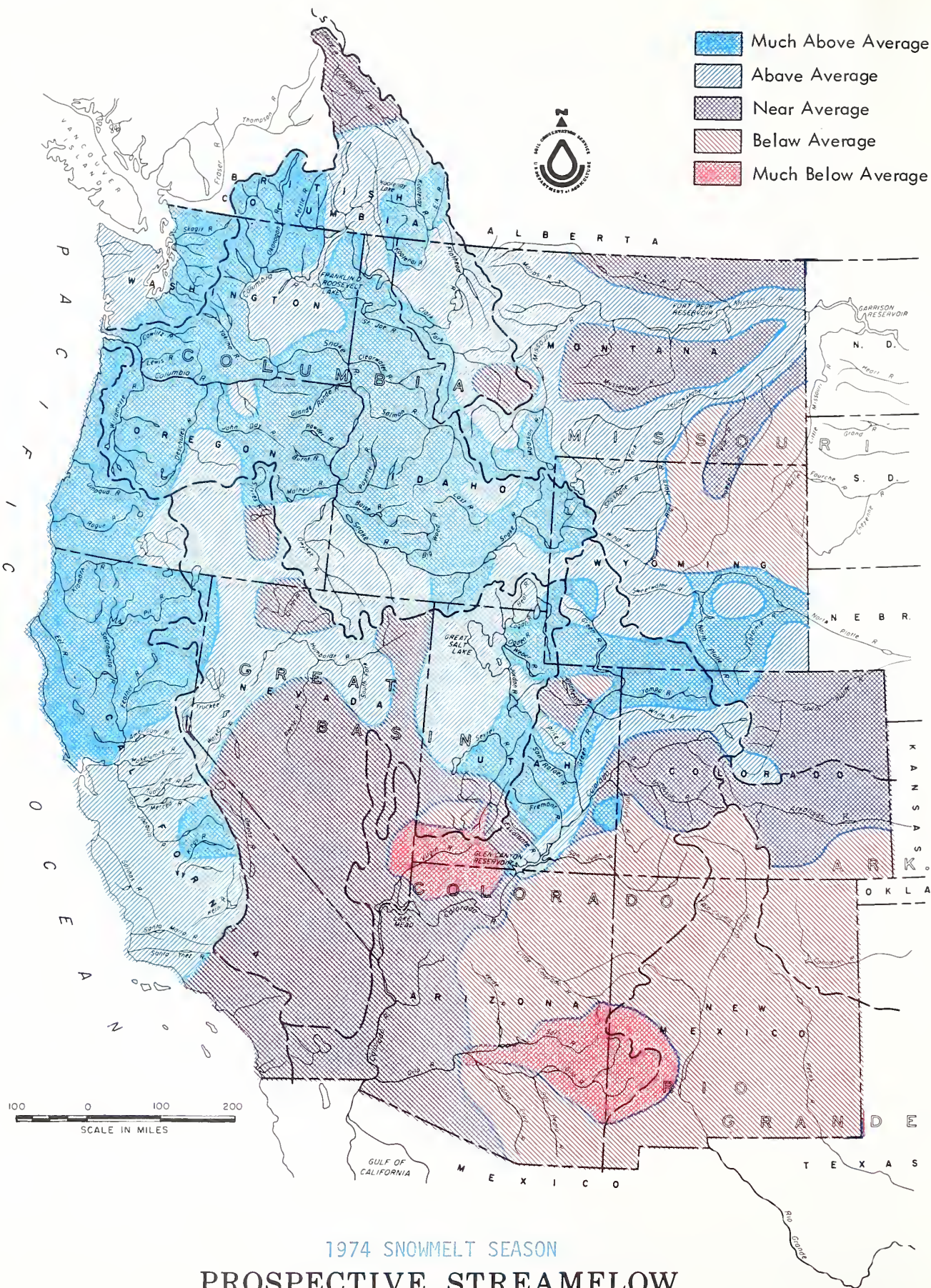
The Water Resources Service, Department of Lands, Forests, and Water Resources directs snow surveys in British Columbia.

This report was prepared by the Water Supply Forecasting Unit, Engineering Division, Soil Conservation Service, from data supplied by Snow Survey Supervisors of the Soil Conservation Service in the States of Alaska, Arizona, Colorado and New Mexico, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

Data from California was supplied by the Chief, Water Supply Forecast and Snow Survey Unit, Department of Water Resources.

Data from British Columbia was supplied by the Chief, Hydrology Division, Water Investigations Branch, Department of Lands, Forests and Water Resources.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
KENNETH E. GRANT, ADMINISTRATOR



WATER SUPPLY OUTLOOK

1974 SNOWMELT SEASON
MAY 1, 1974

REASONABLY SATISFACTORY TO EXCELLENT WATER SUPPLIES ARE AVAILABLE FOR MAJOR IRRIGATED AREAS OF THE WEST, ALTHOUGH HEAVY RESERVOIR DRAWDOWN WILL BE REQUIRED IN ARIZONA AND NEW MEXICO. SOME LATE SEASON SHORTAGES EXPECTED BY WATER USERS ON DIRECT FLOW DIVERSIONS IN SMALLER AREAS OF UTAH, COLORADO, WYOMING AND MONTANA. RECORD TO NEAR RECORD HIGH SNOWS CREATE POTENTIAL FOR HIGH WATER PROBLEMS ON MANY UNCONTROLLED STREAMS, PARTICULARLY IN THE COLUMBIA BASIN.

Water supplies for irrigation will be generally very good this year. Although snowmelt runoff in Arizona and New Mexico will be insufficient to meet this year's irrigation demands, the shortages will largely be offset by excellent reservoir carryover from last year. Heavy ground water pumping will be required along the Gila River to offset the streamflow deficit.

Smaller areas of Arizona, New Mexico, southern Utah, southern Colorado, northeastern Wyoming and southeastern Montana can expect some late summer water shortages, principally along streams where water users are dependent on direct flow diversions.

In contrast to the above drier areas, many snow courses in the Northwest - principally in Oregon and Idaho and smaller areas of Washington and Montana - have established new record high readings. Snow cover is also very heavy in parts of northern California, Utah, Wyoming and northern Colorado.

The British Columbia Water Resources Service, Department of Lands, Forests and Water Resources reports that snow cover is near 10 percent above average on the upper Columbia, that it increases to 30 to 40 percent above average on the lower Columbia, the West Kootenay and Kettle rivers, and is highest on the East Kootenay, Okanagan and Similkameen rivers at 40 to over 55 percent above average.

In the Missouri Basin, most major water producing areas will generally yield 10 to 30 percent above their usual amounts. However, as much as 30 to 50 percent above average flows are expected from streams such as Montana's Madison River and adjacent streams and the North Platte and its major tributaries along the Wyoming-Colorado border. Flow of most streams draining from the Big Horn Mountains and the Black Hills will be near three-fourths of average.

Near normal runoff is expected from the South

Platte and Arkansas rivers in Colorado. While runoff will generally be near three-fourths of average on a few southern tributaries to the Arkansas, and on the Canadian, Pecos and Rio Grande rivers, reservoir storage is above average.

The California Department of Water Resources reports that water supply conditions are excellent throughout the State. April precipitation has been above average in the higher elevations. As a result, snow water content is well above average in all areas. Reservoir storage is also above average throughout the State and most major reservoirs are expected to fill this year. Current forecasts of April thru July runoff are above average for all watersheds, and indicate an increase for nearly all streams over last month.

Snow cover in the Upper Colorado River Basin increased during April, and for the Basin as a whole is 14 percent above average. Water supplies will be adequate to excellent in all areas except the eastern part of Utah's Uinta Basin and on streams in the Four Corners area. These streams will flow at near three-fourths of their average amount.

Except for minor areas in southwestern Utah, a very good water season is in prospect for all areas of the Great Basin. This includes western Utah, most of Nevada, and smaller areas of Oregon, California, Idaho and Wyoming.

Most streams in Alaska are expected to flow at below normal amounts. The exceptions are the Copper River, Kenai Peninsula and in southeastern Alaska where streamflow should be near normal.

MISSOURI BASIN

Most major watersheds of the Missouri Basin have an above average snowpack, the principal

SUMMARY OF SNOW WATER EQUIVALENT MEASUREMENTS

MAJOR BASIN AND SUB - WATERSHED	WATER EQUIVALENT IN PERCENT OF:		MAJOR BASIN AND SUB - WATERSHED	WATER EQUIVALENT IN PERCENT OF:	
	LAST YEAR	AVERAGE		LAST YEAR	AVERAGE
MISSOURI BASIN			SNAKE BASIN		
Jefferson	145	117	Snake above Jackson, Wyo.	165	145
Madison	137	122	Snake above Hiese, Idaho	160	132
Gallatin	125	117	Snake abv.American Falls Res.	144	135
Missouri Main Stem	127	98	Henry's Fork	157	128
Yellowstone	126	116	Southern Idaho Tributaries	107	120
Shoshone	138	136	Big and Little Wood	207	135
Wind	133	128	Boise	200	145
North Platte	96	125	Owyhee	168	106
South Platte	97	118	Payette	207	142
ARKANSAS BASIN			Malheur	705	200
Arkansas	84	118	Weiser	385	201
Cucharas-Purgatoire	1	16	Burnt	625	185
RIO GRANDE BASIN			Powder	335	180
Rio Grande (Colo.)	38	79	Salmon	604	257
Rio Grande (New Mexico)	---	---	Grande Ronde	260	155
Pecos	---	---	Clearwater	214	126
COLORADO BASIN			LOWER COLUMBIA BASIN		
Green (Wyo.)	135	116	Yakima	484	217
Yampa - White	121	157	Umatilla	965	315
Duchesne	37	65	John Day	630	180
Price	57	101	Deschutes	340	185
Upper Colorado	97	128	Hood	500	210
Gunnison	74	116	Willamette	535	200
San Juan	52	83	Lewis	776	187
Dolores	48	115	Cowlitz	370	166
Virgin	21	57	PACIFIC COASTAL BASIN		
Gila	---	---	Puget Sound	314	144
Salt	---	---	Olympic Peninsula	217	119
GREAT BASIN			Umpqua - Rogue	425	188
Bear	117	124	Klamath	435	185
Logan	130	126	Trinity	120	165
Ogden	54	104	CALIFORNIA		
Weber	111	133	CENTRAL VALLEY		
Provo - Utah Lake	71	127	Upper Sacramento	155	170
Jordan	81	145	Feather	135	165
Sevier	65	115	Yuba	120	155
Walker - Carson	101	126	American	120	135
Tahoe - Truckee	117	122	Mokelumne	120	140
Humboldt	82	117	Stanislaus	100	135
Lake Co. (Oregon)	135	150	Tuolumne	105	145
Harney Basin (Oregon)	835	195	Merced	85	150
Owens (California)	100	155	San Joaquin	95	145
UPPER COLUMBIA BASIN			Kings	85	155
Columbia (Canada)	154	122	Kaweah	65	150
Kootenai (USA & Canada)	187	140	Tule	5	15
Clark Fork	192	115	Kern	75	140
Bitterroot	203	133	Data for California Watersheds supplied by Dept. of Water Resources, and for British Columbia Watersheds by Dept. of Lands, Forests and Water Resources.		
Flathead	195	135			
Spokane	324	136	Average is for the 1958-72 period. California averages are for the period 1931-70. Based on Selected Snow Courses determined by Distribution within the Basin, Length of Record and Re- petitive Monthly Measurement Schedules.		
Okanogan	235	176			
Methow	303	334			
Chelan	226	148			
Wenatchee	765	184			

exceptions being in the Big Horn Mountains and the Black Hills. A near record high snowpack lies on the Madison River drainage and on the upper Big Hole River south and west of West Yellowstone. April snow accumulations were highly variable, some areas receiving heavy water increases to the snowpack. One example was on the Gallatin River where the high elevation snowpack increased by as much as 6 to 10 inches of water.

Outlook for Montana streams ranges from about three-fourths of average on the Little Bighorn and Powder rivers which drain from Wyoming's Big Horn Mountains, near average on streams in the center of the state such as the Musselshell and Belt rivers, to near record high volumes on the Madison and Beaverhead rivers. Flow of most Montana streams will be near 20 to 40 percent above their usual amounts.

Except for streams draining from the Big Horn Mountains and the Black Hills, the outlook for all other Wyoming streams is excellent. About 15 to 30 percent above average flows are expected from the Wind, Shoshone, Clarks Fork and Bighorn rivers and their tributary streams.

In the southern Wyoming-northern Colorado area the North Platte and Laramie rivers and most of their tributaries are forecast to produce from 30 to 50 percent greater than average. Stream forecasts are lower for the South Platte in Colorado, but still remain at near average to 20 percent above average.

Reservoir storage is average or above in Wyoming and Colorado. While it is a little below average in Montana, runoff should be more than adequate to refill most of the reservoirs.

ARKANSAS BASIN

Light April storms have resulted in a lowering of stream forecasts for the southern tributaries to the Arkansas River. Fortunately, however, they were average on the watersheds of the Arkansas above Salida so that the runoff forecast at this point remains the same as it was a month ago - near normal.

If late spring and summer precipitation is near normal, the flow of the Arkansas at Salida will be about 4 percent less than average. Runoff from the Cucharas will be a little lower, or about 10 percent less than average. Outlook for the Purgatoire drops off still further to 17 percent below average. Flow of the Canadian River will be below average.

John Martin Reservoir is empty, but Turquoise holds 52,000 acre-feet. In New Mexico, on the Canadian River, storage in Conchas Reservoir is 28 percent above average.

RIO GRANDE BASIN

Dry weather of previous months continued thru April on the headwaters of the Rio Grande River, continuing to reduce the outlook for this summer's water supply. The snowpack on the New Mexico tributaries has mostly disappeared, while in Colorado it is 21 percent below average.

The Rio Grande near Del Norte, Colorado is now expected to flow at three-fourths of its average April-September amount. Inflow to the river system from the Conejos is now expected to be 17 percent below average, while prospects of flow from the Chama River drops off to 20 percent below average.

As a result of last year's high runoff, combined with early season snowmelt this year, reservoir storage is excellent. Storage in Elephant Butte is 189 percent of average, while El Vado holds near four and three-fourths times its average amount for the 1st of May.

COLORADO BASIN

Cool temperatures prevailed over most watersheds of the Upper Colorado Basin during the first two or three weeks of April. Mountain snowfall was generally near or above average. The cool, damp combination has resulted in increased runoff forecasts for nearly all streams. April snowmelt was delayed, leaving more runoff to come during the main snowmelt period. This will be beneficial to water users served by direct stream diversions.

The present snowpack now varies from a low of 65 percent of average on Utah's Duchesne River (eastern tributaries) to a high of 157 percent of average on Colorado's Yampa-White rivers. For the Upper Colorado Basin as a whole, the snow is about 14 percent above average.

Water supplies in the Upper Basin are expected to be adequate to excellent this summer in all areas except the eastern part of Utah's Uinta Basin, on the San Juan River and its tributaries in the Four Corners area, and on the Dolores River. All these streams now have the prospect of producing near three-fourths of their average flows. Some late summer shortages can develop in these areas, particularly if late spring and summer weather is drier than usual.

About 30 to 40 percent above average flows are expected from the Green and Yampa rivers, as well as Utah's San Rafael and Fremont rivers. Forecast for the Colorado River near Cisco, Utah is 105 percent. Flow of the Green River

SELECTED STREAMFLOW FORECASTS

MAY 1, 1974

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
SASKATCHEWAN				
St. Mary near Babb, Montana <u>1/</u>	525	126	May-Sept.	
UPPER MISSOURI				
Beaverhead near Grant, Montana <u>2/</u>	150	142	May-Sept.	84
Big Hole near Melrose, Montana	790	119	May-Sept.	
Jefferson at Silver Star, Montana	1,020	122	May-Sept.	
Madison near Grayling, Montana <u>3/</u>	565	133	May-Sept.	387
Gallatin near Gateway, Montana	615	121	May-Sept.	
Sun at Gibson Dam, Montana <u>4/</u>	620	112	May-Sept.	269
Belt near Monarch, Montana	120	104	May-Sept.	
Marias near Shelby, Montana <u>5/</u>	570	117	May-Sept.	
Missouri near Landusky, Montana <u>6/</u>	5,200	125	May-Sept.	
near Williston, North Dakota <u>7/</u>	12,900	125	May-Sept.	
S. Fk. Musselshell above Martinsdale, Montana	45	101	May-Sept.	
Milk at Eastern Crossing, Montana	230	104	May-Sept.	
Yellowstone at Yellowstone Lake Outlet, Wyo.	1,080	123	April-Oct.	623
at Corwin Springs, Montana	2,300	120	May-Sept.	1,422
at Miles City, Montana <u>8/</u>	7,100	120	May-Sept.	
Clarks Fork near Belfry, Montana	700	119	May-Sept.	
Shoshone below Buffalo Bill Res., Wyo. <u>9/</u>	1,040	126	April-Sept.	582
Wind near Dubois, Wyoming	135	132	April-Sept.	72
at Riverton, Wyoming <u>10/</u>	860	130	April-Sept.	588
Bull Lake Creek near Lenore, Wyoming	211	116	April-Sept.	185
Little Popo Agie near Lander, Wyoming	59	124	April-Sept.	62
Tensleep near Tensleep, Wyoming	71	81	April-Sept.	
Medicine Lodge near Hyattville, Wyoming	22	74	April-Sept.	19.6
Shell Creek near Shell, Wyoming	73	77	April-Sept.	78
Bighorn near St. Xavier <u>8/</u>	2,200	128	May-Sept.	
Tongue near Dayton, Wyoming	117	104	April-Sept.	122
No. Fork Powder near Hazelton, Wyoming	8.4	84	April-Sept.	8.0
PLATTE				
North Platte at Saratoga, Wyoming	950	152	April-Sept.	
Encampment near Encampment, Wyoming	186	132	April-Sept.	159
Deer Creek at Glenrock, Wyoming	29	110	March-July	109
Laramie Riv. & Pioneer Canal, nr Woods, Wyo. <u>12/</u>	186	146	April-Sept.	179
Big Thompson at Drake, Colorado <u>13/</u>	112	105	April-Sept.	
Clear at Golden, Colorado <u>14/</u>	155	122	April-Sept.	
St. Vrain at Lyons, Colorado <u>15/</u>	75	100	April-Sept.	
Cache La Poudre near Fort Collins, Colorado <u>16/</u>	265	107	April-Sept.	
ARKANSAS				
Arkansas at Salida, Colorado <u>17/</u>	300	96	April-Sept.	
Cucharas near LaVeta, Colorado	9	90	April-Sept.	
Purgatoire at Trinidad, Colorado	30	83	April-Sept.	
RIO GRANDE				
Rio Grande near Del Norte, Colorado <u>18/</u>	350	75	April-Sept.	
at Otowi Bridge, New Mexico <u>19/</u>	400	76	March-July	
Conejos near Mogote, Colorado <u>20/</u>	153	83	April-Sept.	
El Vado Res., Inflow, New Mexico	152	80	March-July	
Pecos at Pecos, New Mexico	38	93	March-July	
UPPER COLORADO				
Colorado, Grandby Res., Inflow, Colorado <u>21/</u>	245	107	April-Sept.	
near Dotsero, Colorado <u>22/</u>	1,475	103	April-Sept.	
near Cameo, Colorado <u>23/</u>	2,400	101	April-Sept.	
near Cisco, Utah <u>24/</u>	2,983	105	April-July	
Lake Powell Inflow, Arizona <u>25/</u>	7,885	115	April-July	
Roaring Fork at Glenwood Springs, Colorado <u>26/</u>	725	102	April-Sept.	
Uncompahgre at Colona, Colorado	130	97	April-Sept.	

Forecasts in California provided by Department of Water Resources.

Average is for 1958-72 period except California. California is computed for 1921-70 period.

Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

SELECTED STREAMFLOW FORECASTS

MAY 1, 1974

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
UPPER COLORADO (continued)				
Gunnison, Blue Mesa Res. Inflow, Colorado <u>27/</u>	730	92	April-Sept.	
near Grand Junction, Colorado <u>28/</u>	1,275	108	April-Sept.	
Dolores at Dolores, Colorado	180	78	April-Sept.	
Green at Warren Bridge, Wyoming	405	124	April-Sept.	267
at Green River, Wyoming <u>29/</u>	1,350	136	April-Sept.	720
Flaming Gorge Res. Inflow, Utah <u>27/</u>	1,603	136	April-July	
at Green River, Utah <u>30/</u>	3,771	133	April-July	
Big Sandy near Big Sandy, Wyoming	70	123	April-Sept.	56
Yampa at Steamboat Springs, Colorado	390	142	April-Sept.	
near Maybell, Colorado	1,250	132	April-Sept.	
Little Snake near Dixon, Wyoming	415	138	April-Sept.	393
White near Meeker, Colorado	350	119	April-Sept.	
Strawberry at Duchesne, Utah <u>40/</u>	50	109	May-July	
Duchesne near Tabiona, Utah <u>31/</u>	102	109	May-July	
at Randlett, Utah <u>40/</u>	220	110	May-July	
Lakefork below Moon Lake, Utah <u>32/</u>	55	83	May-July	
Uinta near Neola, Utah	61	73	May-July	
Whiterocks near Whiterocks, Utah	40	71	May-July	
Price, Scofield Res. Inflow, Utah <u>33/</u>	37	128	May-July	
Cottonwood near Orangeville, Utah <u>34/</u>	57	133	May-July	
San Juan, Navajo Res. Inflow, New Mexico <u>27/</u>	500	84	April-July	
near Bluff, Utah <u>35/</u>	690	81	April-July	
Animas at Durango, Colorado	340	80	April-Sept.	
LOWER COLORADO				
Virgin near Virgin, Utah	13	46	May-June	
Little Colorado above Lyman, Arizona	0.5	29	May-June	47
Gila near Solomon, Arizona	3.5	28	May	298
Frisco at Clifton, Arizona	2	32	May	180
Salt at Intake, Arizona	14	32	May	362
Tonto above Roosevelt, Arizona	1	67	May	14
Verde above Horseshoe Dam, Arizona	9	89	May	82
GREAT BASIN				
Bear at Utah-Wyo. State Line	140	132	May-July	
at Harer, Idaho	350	164	May-Sept.	
Smith's Fork near Border, Wyoming	168	145	April-Sept.	86
Thomas Fork near Wyo.-Ida. State Line	55	171	April-Sept.	30
Logan near Logan, Utah <u>36/</u>	117	119	May-July	
Ogden, Pine View Res. Inflow, Utah <u>27/</u>	100	156	May-June	
Weber near Oakley, Utah	130	143	May-June	
Provo near Hailstone, Utah <u>37/</u>	108	126	May-July	
Strawberry Res. Inflow, Utah	40	114	May-July	
Utah Lake Net Inflow, Utah	200	140	May-July	
Big Cottonwood near Salt Lake City, Utah	36	112	May-July	
Beaver near Beaver, Utah	19	108	May-July	
Sevier near Hatch, Utah	18.7	55	May-July	
near Gunnison, Utah	50	179	May-July	
So. Fork Humboldt near Elko, Nevada	74	130	May-July	
Humboldt at Palisades, Nevada	181	121	May-July	
Truckee at Farad, California <u>38/</u>	252	127	May-July	
East Carson near Gardnerville, Nevada	168	112	May-July	
West Carson at Woodsfords, California	49	120	May-July	
East Walker near Bridgeport, California <u>39/</u>	61	103	May-August	
West Walker near Coleville, California	144	112	May-July	
Donner und Blitzen near Frenchglen, Oregon	43	103	May-Sept.	
Silvies near Burns, Oregon	48	138	May-Sept.	10.6
Chewaucan near Paisley, Oregon	73	122	May-Sept.	33
Deep above Adel, Oregon	57	127	May-Sept.	
Bidwell near Ft. Bidwell, California	12.7	141	May-July	
Owens below Long Valley Res., California	78	126	April-July	

Forecasts in California provided by Department of Water Resources.
Average is for 1958-72 period except California. California is computed for 1921-70 period.
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

SELECTED STREAMFLOW FORECASTS

MAY 1, 1974

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
UPPER COLUMBIA				
Columbia at Birchbank, British Columbia <u>40/</u>	49,800	115	May-Sept.	32,819
at Grand Coulee, Washington <u>40/</u>	77,300	124	May-Sept.	41,905
below Rock Island, Washington	84,800	125	May-Sept.	45,114
Kootenai below Libby Dam near Libby, Montana	8,600	123	May-Sept.	4,962
at Leonia, Idaho	10,500	127	May-Sept.	5,484
Blackfoot near Bonner, Montana	1,150	127	May-Sept.	376
So. Fk. Flathead nr Columbia Falls, Montana <u>40/</u>	2,500	118	May-Sept.	1,314
Flathead at Columbia Falls, Montana <u>40/</u>	6,950	120	May-Sept.	3,831
near Polson, Montana <u>40/</u>	8,350	122	May-Sept.	4,245
Clark Fork above Missoula, Montana	1,970	124	May-Sept.	616
near Plains, Montana <u>40/</u>	14,100	126	May-Sept.	6,011
at Whitehorse Rapids, Idaho	15,600	124	May-Sept.	
Bitterroot near Darby, Montana	760	144	May-Sept.	266
Priest near Priest River, Idaho <u>41/</u>	830	121	May-July	
Pend Oreille below Box Canyon, Washington	17,800	130	May-Sept.	6,929
Kettle near Laurier, Washington	2,330	144	May-Sept.	983
Spokane at Post Falls, Idaho <u>42/</u>	3,250	162	May-Sept.	
Similkameen near Nighthawk, Washington	2,000	140	May-Sept.	673
Okanogan near Tonasket, Washington	2,350	148	May-Sept.	704
Methow near Pateros, Washington	1,420	150	May-Sept.	466
Stehekin at Stehekin, Washington	1,130	136	May-Sept.	490
Chelan at Chelan, Washington <u>43/</u>	1,600	140	May-Sept.	702
Wenatchee at Peshastin, Washington	2,330	147	May-Sept.	903
SNAKE				
Snake above Palisades Res., Wyoming <u>44/</u>	3,840	147	April-Sept.	1,966
near Heise, Idaho <u>45/</u>	5,150	144	May-Sept.	
near Blackfoot, Idaho <u>46/</u>	5,425	143	May-July	
at Weiser, Idaho	7,000	138	May-Sept.	
Grey's above Palisade, Wyoming	490	126	April-Sept.	293
Salt above Palisade, Wyoming	460	126	April-Sept.	318
Henry's Fork near Ashton, Idaho <u>47/</u>	740	130	May-Sept.	
Teton near St. Anthony, Idaho	525	132	May-Sept.	
Big Lost near Mackay, Idaho <u>48/</u>	220	131	May-Sept.	
Little Lost near Howe, Idaho	40	113	May-Sept.	
Portneuf at Topaz, Idaho	75	115	May-Sept.	
Salmon Falls Creek nr San Jacinto, Idaho	65	120	May-Sept.	
Little Wood abv High 5 Crk, Idaho	105	148	May-Sept.	
Big Wood, Inflow to Magic Res., Idaho <u>49/</u>	390	187	May-Sept.	
Bruneau near Hot Springs, Idaho	185	113	May-Sept.	
Boise near Boise, Idaho <u>50/</u>	1,950	153	May-Sept.	
Owyhee near Owyhee, Nevada <u>51/</u>	53	129	May-July	
Owyhee Res. Net Inflow, Oregon <u>27/</u>	195	124	May-July	118
Malheur near Drewsey, Oregon	46	144	May-July	
Payette near Horseshoe Bend, Idaho <u>52/</u>	2,400	156	May-Sept.	
Weiser above Crane Creek, Idaho <u>40/</u>	425	155	May-Sept.	
Burnt near Hereford, Oregon <u>40/</u>	24	174	May-July	
Powder near Sumpter, Oregon	60	150	May-July	
Eagle above Skull Creek, Oregon	167	174	May-Sept.	
Imnaha at Imnaha, Oregon	327	129	May-Sept.	
Salmon at Whitebird, Idaho	9,150	145	May-Sept.	
Lostine near Lostine, Oregon	155	132	May-Sept.	
Grande Ronde at LaGrande, Oregon	167	174	May-Sept.	35
Clearwater at Spalding, Idaho	9,500	140	May-Sept.	
LOWER COLUMBIA				
Yakima at CleElum, Washington <u>53/</u>	1,200	151	May-Sept.	441
near Parker, Washington <u>54/</u>	2,160	162	May-Sept.	415
Naches near Naches, Washington <u>55/</u>	1,130	151	May-Sept.	366

Forecasts in California provided by Department of Water Resources.
Average is for 1958-72 period except California. California is computed for 1921-70 period.
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

SELECTED STREAMFLOW FORECASTS

MAY 1, 1974

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
LOWER COLUMBIA (continued)				
Walla Walla, So. Fk. near Milton, Oregon	70	137	May-Sept.	
Umatilla at Pendleton, Oregon	125	171	May-Sept.	
John Day, Middle Fork at Ritter, Oregon	93	139	May-July	
North Fork at Monument, Oregon	560	158	May-July	
Crooked near Post, Oregon	40	125	May-July	
Deschutes at Benham Falls, Oregon 40/	351	125	May-Sept.	
Columbia at The Dalles, Oregon 40/	116,000	127	May-Sept.	57,890
	98,000	128	May-July	47,028
Hood near Tucker Bridge, Oregon 40/	293	156	May-July	
McKenzie near Vida, Oregon	1,019	142	May-July	
Santiam, South, at Waterloo, Oregon	452	140	May-July	
North, at Mehama, Oregon 40/	707	143	May-July	
Clackamas at Estacada, Oregon	617	138	May-July	237
Willamette at Salem, Oregon 40/	3,667	140	May-July	
Lewis at Ariel, Washington 56/	1,400	150	May-Sept.	570
Cowlitz at Castle Rock, Washington 57/	3,110	148	May-Sept.	1,224
NORTH PACIFIC COASTAL				
Dungeness near Sequim, Washington	170	116	May-Sept.	
Umpqua, No., near Toketee Falls, Oregon 40/	195	140	May-Sept.	
Rogue at Raygold, Oregon	650	132	May-July	302
Klamath Lake, Net Inflow, Oregon	450	127	May-Sept.	219
Trinity at Lewiston, California	1,060	172	April-July	690
CALIFORNIA CENTRAL VALLEY 40/				
Sacramento, Inflow to Shasta, California	2,600	147	April-July	1,538
Feather near Oroville, California	2,870	154	April-July	1,913
Yuba at Smartville, California	1,410	131	April-July	1,002
American, Inflow to Folsom Res., Calif.	1,640	125	April-July	1,260
Cosumnes at Michigan Bar, California	230	159	April-July	117
Mokelumne, Inflow to Pardee Res., Calif.	600	129	April-July	520
Stanislaus, Inflow to Melones Res., Calif.	875	122	April-July	738
Tuolumne, Inflow to Don Pedro Res., Calif.	1,440	121	April-July	1,414
Merced, Inflow to Exchequer Res., Calif.	710	117	April-July	730
San Joaquin, Inflow to Millerton Lake, Calif.	1,600	134	April-July	1,546
Kings, Inflow to Pine Flat Res., California	1,530	132	April-July	1,660
Kaweah, Inflow to Terminus Res., California	320	118	April-July	451
Tule, Inflow to Success Res., California	65	110	April-July	111
Kern, Inflow to Isabella Res., California	470	112	April-July	724
ALASKA				
Chena at Fairbanks, Alaska	410	80	May-July	508
Salcha near Salchaket, Alaska	590	77	May-July	662
Ship Creek near Anchorage, Alaska	50	89	May-July	39
So. Fk. Campbell Creek near Anchorage, Alaska	11	85	May-July	9

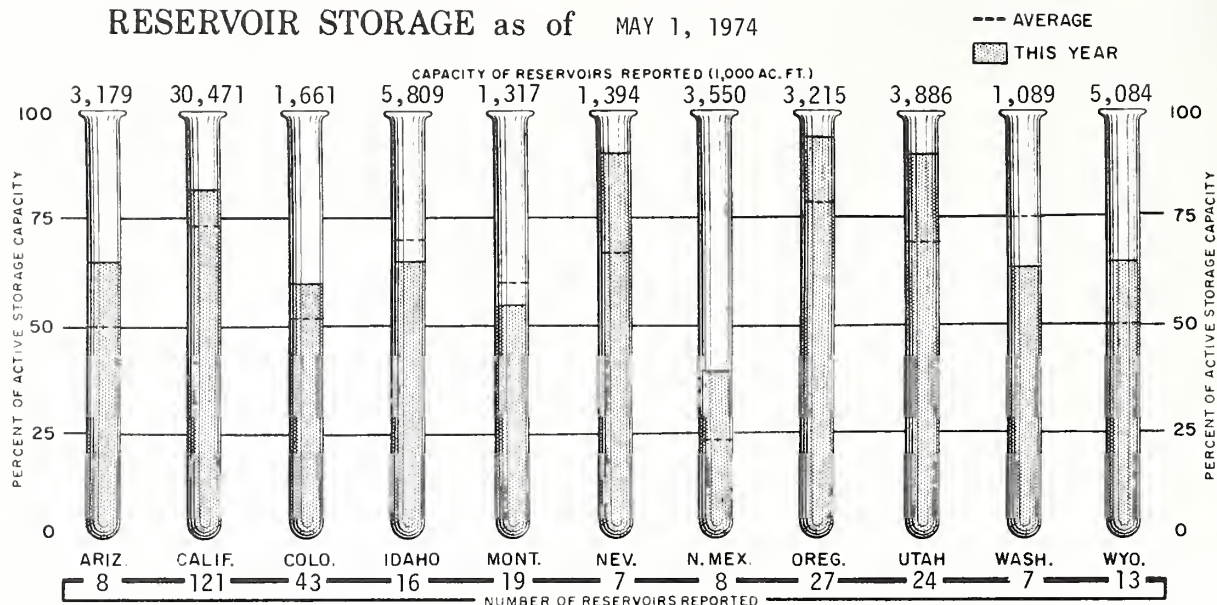
Forecasts in California provided by Department of Water Resources.

Average is for 1958-72 period except California. California is computed for 1921-70 period.

Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

RESERVOIR STORAGE as of MAY 1, 1974



at Green River, Utah is expected to be 133 percent, while the forecast for the San Juan near Bluff, Utah drops to 81 percent. Combining the above forecasts indicates an April-July inflow to Lake Powell of 7,885,000 acre-feet, or 115 percent of average.

In the lower Colorado Basin the Virgin River now has prospects of yielding only 46 percent of the average flow during the May-June period. In Arizona the snow is gone except for the very high elevations. The melting snows produced very little runoff this year due to the extremely dry soils under the snow and the absence of significant precipitation during April. The major streams produced less than one-third of average runoff during April.

Central Arizona reservoirs contain 29 percent above average storage due to carryover from last year. While reservoir storage is decreasing since water use greatly exceeds inflow, the outlook is good for the projects served by the reservoirs. Outlook is poor for areas depending on direct diversion for streams.

GREAT BASIN

Except for a small area in southwestern Utah where the snowpack is generally near 30 to 40 percent below average, watersheds of the Great Basin are holding snows which will produce normal to much above normal streamflow this coming summer. When combined with reservoir storage which is about a third above average, this provides solid assurance that practically all water users in the Basin will have good to excellent water supplies.

The exception to the above good picture is in southern Utah on the South Fork Sevier River, Coal Creek near Cedar City and adjacent smaller streams. Stream forecasts along the South Fork Sevier range from about a fourth to a half of average, and from two-thirds to three-fourths of average for the other streams.

Near average streamflow is expected from the following watersheds: Utah's Clear Creek, Beaver and East Fork Sevier rivers; California's Owens Valley; Oregon's Donner and Blitzen River and adjacent streams; eastern, central and southern areas of Nevada, as well as the Quinn and Martin rivers near the Oregon border.

Streams where snowmelt runoff is expected to range from about 10 to 30 percent greater than usual include all streams in Oregon's Lake County; Nevada's Humboldt, Truckee, Carson and Walker rivers; Utah's American Fork and Provo rivers, smaller streams draining from the Wasatch Front near Salt Lake City, Strawberry Reservoir Inflow, and most tributaries to the Bear River below Bear Lake.

Highest forecast as a percent of average is for Utah's Lost Creek, a tributary to the Weber River, at 214 percent. Other high forecasts include the Sevier River near Gunnison, Utah (179 percent); Thomas Fork near Wyoming-Idaho State Line (171 percent); Bear River near Harer, Idaho (164 percent); Chalk Creek near Fillmore, Utah (163 percent).

Other watersheds where runoff is expected to range from about 130 to 155 percent of average include the streams of California's Surprise Valley; Oregon's Silvies River; Utah and Wyoming tributaries to the Bear River above Bear Lake; and Utah's Ogden, Weber, Spanish

STORAGE IN LARGE RESERVOIRS

May 1, 1974

BASIN AND NAME OF RESERVOIR	CAPACITY (1,000 A.F.)	STORAGE (1,000 A.F.)	STORAGE PERCENT AVERAGE	BASIN AND NAME OF RESERVOIR	CAPACITY (1,000 A.F.)	STORAGE (1,000 A.F.)	STORAGE PERCENT AVERAGE
UPPER MISSOURI				UPPER COLUMBIA			
Belle Fourche	185	160	121	Chelan	676	189	84
Boysen	550	295	159	Coeur d'Alene	225	419	166
Buffalo Bill	373	133	111	Duncan	1,347	140	119
Canyon Ferry	2,043	1,511	97	Flathead	1,791	1,221	125
Fort Peck	19,410	15,930	118	Hungry Horse	3,428	1,522	76
Garrison	24,790	19,096	130	Kootenay	787	755	171
Hebgen	377	200	94	Lake Koocanusa	3,522	1,196	---
Keyhole	192	158	193	Lower Arrow	3,083	901	---
Lake Francis Case	5,816	3,788	91	Noxon Rapids	335	208	151
Lake Sharp	1,900	1,751	101	Pend Oreille	1,155	699	131
Oahe	23,630	19,689	117	Roosevelt	5,232	-1,948	---
Tiber	1,347	549	90	Upper Arrow	4,061	1,155	226
Bighorn Lake	1,356	759	97				
PLATTE				LOWER COLUMBIA			
So. Platte in Colo. (22)	528	464	108	Cougar	155	124	114
City of Denver (5)	507	443	107	Detroit	300	233	93
Colo-Big Thompson (3)	718	601	140	Green Peter	270	214	107
Glendo	784	416	92	Hills Creek	200	152	96
Pathfinder	1,016	959	233	Lookout Point	337	248	96
Seminole	1,010	567	91	Prineville	153	156	106
ARKANSAS				Wickiup -	200	202	107
Conchas	273	224	128	Yakima Res. (5)	1,066	669	84
John Martin	354	0	0	SNAKE			
Turquoise	120	52	---	American Falls	1,125	1,218	112
RIO GRANDE				Anderson Ranch	423	297	105
Elephant Butte	2,195	719	189	Arrowrock	287	241	104
El Vado	195	131	468	Brownlee	980	271	62
UPPER COLORADO				Cascade	653	249	70
Blue Mesa	830	295	---	Dworshak	2,016	187	---
Flaming Gorge	3,749	3,178	195	Jackson	847	499	99
Navajo	1,696	981	174	Lucky Peak	278	94	66
Powell	25,002	18,089	216	Owyhee	715	713	126
Starvation	152	110	---	Palisades	1,200	426	55
LOWER COLORADO				Warm Springs	191	179	128
Havasu	619	601	102	PACIFIC COASTAL			
Mead	26,159	19,064	113	Clair Engle	2,448	2,364	104
Mohave	1,810	1,556	92	Clear Lake	440	387	145
Salt River Res. (4)	1,755	1,363	116	Nacimiento	350	335	166
San Carlos	949	509	260	Ross	1,203	700	191
Verde River Res. (2)	318	101	61	Upper Klamath	584	532	103
GREAT BASIN				CALIFORNIA CENTRAL VALLEY			
Bear Lake	1,421	1,156	111	Almanor	1,308	1,073	132
Deer Creek	150	130	125	Berryessa	1,602	1,618	103
Lahontan	291	263	103	Bullards Bar	930	847	127
Rye Patch	157	167	88	Folsom	1,010	776	104
Sevier Bridge	236	229	200	Isabella	570	290	153
Strawberry	274	227	176	McClure	1,026	811	130
Tahoe	732	623	111	Millerton	521	434	121
Utah Lake	884	932	140	Oroville	3,484	3,223	108
Willard Bay	193	159	98	Pine Flat	1,013	816	125
				Shasta	4,500	4,395	104

Reservoir Storage Data Provided by Bureau of Reclamation, Corps of Engineers, Geological Survey, and water using organizations. Data from California and British Columbia provided by Department of Water Resources and Department of Lands, Forests and Water Resources, respectively.

Fork, middle and lower Sevier rivers and their tributaries, as well as Utah Lake Inflow.

Reservoir storage is exceptionally high. Nevada's Rye Patch and Wild Horse reservoirs are holding contents greater than the normal capacities by adding flashboards along the spillways. Utah Lake is already above Compromise Point, and the Sevier Bridge Reservoir has already been filled this season. Total reservoir storage is about a third more than average and only 11 percent less than full capacity.

COLUMBIA BASIN

Snowpack losses at low elevations were generally greater than average during April. At middle and high elevations, however, the net effect of snowfall and snowmelt has resulted in greater than average increases. For the Columbia Basin as a whole, as reflected by the forecast for the Columbia River at The Dalles, Oregon, prospective runoff has increased slightly. The present May-September forecast of 116 million acre-feet, at 127 percent of average, represents the third highest runoff since 1916.

In general, the present snowpack is within 15 percent of average in southern Idaho on Montana's Upper Clark Fork River, and on the Upper Columbia River in British Columbia. The snow varies between 20 and 40 percent above average on British Columbia's West Kootenay, Lower Columbia and Kettle rivers; in eastern Washington; in Idaho on Henry's Fork of the Snake River, and from the Clearwater River northward to the Pend Oreille River; in western Montana from the Bitterroot northward to, but not including, the Kootenai River.

All remaining watersheds have more than 40 percent above their average snowpack. On most of these watersheds -- in western Washington, British Columbia's Okanagan-Similkameen rivers, Oregon, south central Idaho, as well as on the Priest River in the Panhandle, and on Montana's Kootenai River drainages -- the snow ranges from one and a half to well over twice the average amount.

In Oregon thirty-two snow courses recorded all time maximum water contents for May 1, most of the snow being at median and high elevations. The record high readings occurred along the Cascade Crest, in the Blue Mountains above Pendleton, in the Elkhorn Mountains near Baker, and in the Wallowa Mountains.

Fifteen snow courses in northern and south central Idaho established record high readings for May 1.

Because there is a large amount of reservoir space available for flood control by the Corps of Engineers, no major flooding is expected along the main stem of the Columbia River. However, areas above reservoirs and along uncontrolled streams in the heavy runoff areas can expect to experience some problems during the major snowmelt period.

ALASKA

The spring snowmelt started earlier than usual over much of Alaska, the low elevation snow having already disappeared from many watersheds. However, melting of the higher elevation snowpack has not yet started.

Nearly all snow courses show readings which are well below those of last year, and also much below average. The only exceptions -- where near average snowpacks remain -- are on the Copper River, the Kenai Peninsula and in southeastern Alaska.

Snowmelt runoff during the May-July period is forecast to be 80 and 77 percent of average, respectively, for the Chena and Salcha rivers. Near Anchorage the expected yield from Ship Creek and South Fork Campbell Creek is 89 and 85 percent.

CALIFORNIA

The California Department of Water Resources, coordinating agency for snow surveys and water supply forecasting in California, reports that excellent water supply conditions exist throughout the State. May 1 snow surveys show that additional accumulations during the past month boosted snow water content to new highs for the season, assuring above average surface supplies for all areas this year.

Forecasts of April through July runoff for all major streams in the State are above average. Runoff forecasts for all streams have increased over last month due to above normal precipitation at higher elevations, except for the Lahontan area where forecasts decreased slightly. In the San Joaquin Valley, forecasts range from 110 percent of average on the Tule River to 134 percent on the San Joaquin River. Sacramento Valley streams are forecasted to produce from 125 percent of average on the American River to 170 percent on the Sacramento River for the period. Statewide, forecasts range from a low of 106 percent of average for the Mono Lake Basin streams to a high of 172

percent for the Trinity River.

Snowpack water content increased in all watersheds and is well above average throughout the State. The series of April storms delayed the onset of sustained spring melt, especially at the higher elevations. Density profiles of the snowpack obtained at the U.S. Forest Service's Central Sierra Snow Laboratory show that the pack is now ripe in both open and forested areas and that sustained snowmelt runoff has commenced.

Precipitation during April was mostly below average on the Central Valley floor and in Southern California. However, most mountain watersheds and Central Coastal areas received from 130 to 150 percent of average precipitation for the month, with several local areas experiencing over 200 percent. Cooler than normal April temperatures resulted in retaining most of the precipitation as snow above 6,000 feet.

Runoff during April was above average in all areas except on the South Coast, and in portions of the Lahontan area. In the Central Valley, runoff ranged from about average on the Tuolumne River to 195 percent on the Pit River. All streams except those in the South Coastal area have produced well above average runoff for the October 1 to May 1 portion of the water year. Most North Coastal and Northern Sacramento Valley streams continue to exceed all previous runoff records.

Reservoir storage is above average throughout California. In the Sacramento Valley the nearly 15 million acre-feet in storage amounts to 110 percent of average and fills 90 percent of available capacity. In the San Joaquin Valley over 5 million acre-feet is now in storage which represents 115 percent of average and 65 percent of available capacity. Many of the multiple use reservoirs will fill this spring as flood reservations are removed and abundant snowmelt inflows occur.



EXPLANATION of STREAMFLOW FORECASTS

All flows are observed flows except as adjusted for: 1/ Storage change in Lake Sherburne. 2/ Storage change in Lima and Clark Canyon reservoirs. 3/ Storage change in Hebgen Lake. 4/ Storage change in Gibson Reservoir and measured diversions. 5/ Storage change in Two Medicine, Four Horns, Lake Francis and Swift reservoirs. 6/ Storage change in Canyon Ferry and Tiber reservoirs. 7/ Changes as indicated in (6/), (8/), plus storage change in Fort Peck. 8/ Storage change in Boysen, Buffalo Bill and Yellowtail reservoirs. 9/ Storage change in Buffalo Bill Reservoir plus Heart Mountain diversion. 10/ Storage change in Pilot Butte and Bull Lake reservoirs plus Wyoming canal diversion.

11/ Changes indicated in (10/) plus storage change in Boysen Reservoir. 12/ Plus diversions to Cache LaPoudre. 13/ Plus by-pass to power plants. 14/ Minus diversion thru Gumlick Tunnel. 15/ Storage change in Price Reservoir. 16/ Minus diversions from North Platte, Laramie and Colorado rivers plus measured diversions above station. 17/ Storage change in Clear Creek, Twin Lakes and Turquoise reservoirs minus diversions from Colorado River. 18/ Storage change in Rio Grande, Santa Maria and Continental reservoirs. 19/ Storage change in El Vado and Abiquiu reservoirs. 20/ Storage change in Platoro Reservoir.

21/ Storage change in Grandby Reservoir as furnished by U.S.B.R. plus diversions by Adams Tunnel and Grand River Ditch. 22/ Changes as indicated in (21/) plus diversions thru Roberts, Gumlick and Moffat tunnels and storage change in Dillon, Homestake, Williams Fork, Green Mountain and Willow Creek reservoirs. 23/ Changes indicated in (22/) and (26/). 24/ Storage change in Blue Mesa Reservoir. 25/ Changes indicated in (24/), (30/) and (35/) and storage change in Lake Powell. 26/ Diversions to Arkansas River plus storage change in Ruedi Reservoir. 27/ (Inflow record as computed by U. S. Bureau of Reclamation.) 28/ Storage change in Taylor, Blue Mesa and Morrow Point reservoirs. 29/ Storage change in Fontenelle Reservoir. 30/ Storage change in Flaming Gorge Reservoir.

31/ Plus diversion through Duchesne Tunnel. 32/ Storage change in Moon Lake Reservoir. 33/ Storage change in Scofield Reservoir. 34/ Storage change in Joe's Valley Reservoir. 35/ Storage change in Navajo Reservoir. 36/ Plus U. P. & L. Co. tailrace and Logan, Hyde Park and Smithfield canals. 37/ Minus diversions thru Duchesne Tunnel and Weber-Provo Canal. 38/ Storage change in Lake Tahoe and Boca reservoirs (Forecast by Truckee Basin Committee.) 39/ Storage change in Bridgeport Reservoir. 40/ Corrected for major upstream impairments -- represents simulated natural flow conditions.

41/ Storage change in Priest Lake. 42/ Storage change in Coeur d'Alene Lake and diversions by Spokane Valley Farms Co. and Rathrum Prairie canals. 43/ Storage change in Lake Chelan. 44/ Storage change in Jackson Lake. 45/ Storage change in Jackson Lake and Palisade reservoirs. 46/ Storage change in Jackson Lake, Palisades, Island Park, Henry's Lake, Grassy Lake plus diversions between Heise and Blackfoot. 47/ Storage change in Henry's Lake and Island Park reservoirs. 48/ Storage change in MacKay Reservoir and diversion in Sharp Ditch. 49/ Combined flow Big Wood near Bellevue and Camas Creek near Blaine. 50/ Storage change in Arrowrock, Anderson Ranch and Lucky Peak reservoirs.

51/ Storage change in Wild Horse Reservoir. 52/ Storage change in Cascade and Deadwood reservoirs. 53/ Storage change in Keechelus, Kachess and CleElum reservoirs plus diversion by Kittitas Canal. 54/ Changes indicated in (52/) plus storage change in Bumping and Rimrock Lakes plus diversion by Roza, Union Gap, New Reservation, Old Reservation and Sunrise canals. 55/ Storage change in Bumping and Rimrock lakes and diversions by Tieton, Selah Valley, Wapatox canals and City of Yakima. 56/ Storage change in Merwin, Yale and Swift reservoirs. 57/ Storage change in Mayfield Reservoir.

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